LESSON 7
FIGHTING THE ACE

*Aviation is **fundamental** to the future of the Marine Corps--without the "A" there is no MAGTF. That fact bears repeating--**without the "A" there is no MAGTF.***

-- General Charles C. Krulak

*The ACE of MEF was a **large** command. At the war's climax it numbered more than 70 squadron-size or larger units, almost 500 combat aircraft, and more than 16,000 personnel. Built around the 3d MAW, it contained some of every type of aircraft in the Marine Corps inventory.*

-- Colonel Norman G. Ewers, USMC (Ret)
Marine Corps Gazette, October 1991

Introduction

Purpose	This lesson Introduces the structure, capabilities, and missions of the ACE Discusses the ACE's role in the MAGTF Addresses ACE planning concern in joint and multinational environments
Why Study the ACE?	The ACE is one member of the MAGTF task-organized combined arms team. It does not merely support the MAGTF; it is an integral part of the MAGTF falling under the same single commander. Working in a synergistic relationship with the Command Element (CE), Ground Combat Element (GCE), and the Combat Service Support Element (CSSE), the ACE adds a unique dimension to the MAGTF's flexibility, mobility, and combat power. This lesson is structured to provide the "conceptual framework" of how and why the ACE is critical to the MAGTF. The first lead-in quote from the current Commandant illustrates the critical importance of the ACE as seen from the Marine Corps' highest level.

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Introduction, Continued

The ACE and You: Your Task	As a Marine Corps officer, you need to have a thorough understanding of the following aspects of ACE: Structure and organization Functions Missions Operational strengths and limitations Command and control (C^2) systems Roles within the Marine Corps and in joint and/or multinational environments
Relationship to Other Instruction	The overall focus of this course is the MAGTF. To understand the MAGTF in a meaningful way, you must have a good understanding of each of its major elements, including the ACE. This lesson will provide a foundation of knowledge that you will need for subsequent study of the Marine Corps planning process, joint and multinational operations, MAGTF operations, amphibious operations, and operations other than war (OOTW). Beyond the Command and Staff course of study, understanding the ACE better will provide the tools you need to help the Marine Expeditionary Force (MEF) commander fight the single battle, employing the ACE to its fullest potential.
Study Time	This lesson, including the issues for consideration, will require about 7 hours of study.

Educational Objectives

Functions and Capabilities	Understand the six functions of Marine aviation and the capabilities Marine aviation provides the MAGTF.
Omnibus Agreement	Understand the policy for C^2 for USMC TACAIR (formerly known as The Omnibus Agreement).
Operational Control	Understand the implications of operational control regarding Marine aviation in joint operations. [JPME 1(b), 1(e), and 3(c)]
Marine Air Command and Control System	Comprehend the Marine Air Command and Control System (MACCS) and how it interfaces with both internal and external agencies in a joint, combined, and multinational environment. [JPME 1(a), 1(b), and 5(b)]
Joint Planning and Targeting	Understand Marine aviation planning, targeting, and how they integrate in the joint aviation planning and tasking process. [JPME 1(a) and 2(d)]
PME Areas/ Objectives/Hours (accounting data)	1/a/1 1/b/1 1/e/1 2/d/1 3/c/1 5/b/1

Historical Background

The Birth of Marine Corps Aviation

Marine Corps aviation began less than a decade after the Wright brothers' first powered flight. On May 22, 1912, First Lieutenant Alfred A. Cunningham graduated from training at the Navy's new flight school in Annapolis, Maryland. The following year, the embryonic Marine Corps aviation force participated in the annual fleet maneuvers off Guantanamo, Cuba.

During World War I, Marine Corps aviators flew their first combat missions. The First Marine Aviation Force flew antisubmarine patrols from the Azores, while other Marine aviators in France dueled with enemy aircraft in the sky, spotted for artillery, and flew reconnaissance missions.

Interwar Years

The period between the world wars was a particularly active period for Marine aviation. As early as 1919, Marine aircraft were flying ground support missions in Haiti and the Dominican Republic. In an effort to increase bombing accuracy, innovative Marine pilots began developing dive-bombing techniques. By 1927, Marines were flying combat missions against the Sandinistas in Nicaragua. They bombed and strafed the enemy, transported essential supplies, and evacuated the sick and wounded.

Prelude to World War II

In 1933, Marine aviation became part of the new amphibious warfare oriented Fleet Marine Force (FMF). To better serve the needs of the expeditionary forces of the FMF, Marine aviation was reorganized with an East Coast Headquarters, Aircraft One in Quantico, Virginia and a West Coast Headquarters, Aircraft Two in San Diego, California.

The then new *Tentative Landing Operations Manual* assigned Marine aviation units with responsibilities for reconnaissance, fighter escort, protection of the landing forces, artillery spotting, and close air support. In 1939, the Navy's General Board officially established Marine aviation's mission to support the FMF in amphibious operations, support troops once they were ashore, and provide backup squadrons for the Navy's aircraft carriers.

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Historical Background, Continued

World War II

World War II began badly for Marine aviation. The Japanese attack on Pearl Harbor destroyed most of the Marine aircraft on the ground. After a valiant defense, the Marine squadron on Wake Island was wiped out. In the *Battle of Midway,* shore-based Marines fought hard and suffered badly. Facing the best the Japanese had to offer, the Marines flew ancient SB2U Vindicator dive-bombers and the equally obsolete Brewster F2A Buffaloes. After their initial defeats and other difficulties, Marine aviation recovered and quickly grew to a size and capability undreamed of in the prewar years.

In a war dominated by amphibious operations, Marine aviation realized the role that had been foreseen for it. Providing close air support for Marine ground units as they wrestled island after island from Japanese defenders, they protected the landing force at Guadalcanal and supported the island-hopping campaigns. Additionally, Marine squadrons flew from the Navy's fleet carriers, defending them from kamikaze attacks in the closing months of the war.

Growth of the Corps' Aviation

Marine aviation began the war with 232 pilots, 2 aircraft groups, and 9 squadrons, but grew to include 10,412 pilots, 29 aircraft groups, and 132 squadrons by the end of the war. Throughout World War II, Marine Corps aviation became known as the world's expert in providing close air support.

National Security Act

Despite its invaluable contributions to victory in World War II, Marine aviation was in danger of being disbanded in the postwar demobilization and service unification. However, in 1947 the National Security Act codified Marine aviation's mission and basic structure. This law mandated that Marine aviation maintain three air wings to support the Marine Corps in its missions.

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Historical Background, Continued

Korea	During the Korean War, Marine Corps aviators further honed their expertise in providing close air support to the ground forces. When the North Koreans launched their surprise invasion of the South in 1950, MAG-33 pilots were among the first American forces deployed to support the beleaguered United Nations' forces. Marine helicopters of VMO-6 were the first US helicopters employed during combat in Korea. Flying from carriers, Marine aircraft also supported the invasion of Inchon. F4U Corsairs, which had become so closely associated with Marine aviation in World War II, continued to fly bombing missions against North Korean and Chinese military positions. It was during the Korean War, too, that Marine aviation entered the jet age, introducing the Grumman F9F Panther into combat during the closing days of the Chosin campaign.
Vietnam	Marine aviation continued to mature during the prolonged and frustrating struggle in Vietnam. The helicopter was used on a massive scale from ferrying Marines, evacuating the wounded, and providing fire support from the newly developed Cobra gunships to supporting Army units when the need arose. At the conclusion of the Vietnam War, the Marine Corps renewed its commitment to amphibious warfare as the importance of Marine aviation (in the modern form of the MAGTF ACE) increased.
Current Aviation Support	Marine aviation has continued to focus on its traditional role of achieving air superiority and supporting the ground element. During the recent Gulf War, Marine aviation demonstrated its ability to support traditional large-scale ground warfare. In the complicated and unsettled post-Cold War world, Marine aviation has participated in several OOTW, from conducting operations as varied as denying airspace over war-torn areas to rescuing downed pilots. As one of the combat elements of the modern MAGTF, Marine aviation is a unique asset with exceptional flexibility and combat power. Through the years, Marine aviation has maintained its tradition of innovation with the "jump jet" AV-8B Harrier, the unmanned aerial vehicles (UAV), and the MV-22 Osprey. Such programs add depth to the future warfighting capabilities of the MEF and promise new capabilities for years to come.

Overview of Aviation

Structure	The National Security Act of 1947 as amended by Title 10, U.S. Code in 1952 states...*Not less than three combat divisions, three air wings, and such other land combat, aviation, and other services as may be organic therein...*
ACE as part of MAGTF	All MAGTFs have three important elements led by one commander: Ground Combat Element (GCE) Aviation Combat Element (ACE) Combat Service Support Element (CSSE)
ACE C^2	The importance of C^2 will be addressed in the readings on Marine Aviation Command and Control Systems (MACCS) and other service capabilities in air C^2 in joint operations. This is critical since the MACCS encompasses the combined and coordinated employment of personnel, equipment, facilities, and communications while allowing the ACE to plan, direct, and control aviation efforts of the ACE in the joint environment.
MAW	The ACE and the four groups listed below fall under the Marine Aircraft Wing (MAW): Marine Aircraft Group (Fixed Wing) (FW) Marine Aircraft Group (Rotary Wing) (RW) Marine Wing Support Group (MWSG) Marine Air Control Group (MACG)

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Overview of Aviation, Continued

Marine Aircraft Group (FW)

The Marine Aircraft Group (FW) is illustrated in the table below.

Marine Aircraft Group 14

Squadron	Supporting Aircraft
Marine Electronic Warfare Squadron (VMAC)	20 EA-6B
Marine Attack Squadron (VMA)	74 AV-8B; 12 TAV-8B
Marine Aerial Refueling and Transport Squadron (VMGR)	16 KC-130F; 4 KC-130R
Marine Aviation Logistics Squadron (MALS)	

Marine Expeditionary Unit

The Marine Expeditionary Unit (MEU) has three important elements under it:

Battalion Landing Team (BLT)
Composite Aviation Squadron
Combat Service Support Detachment (CSSD)

Concepts of Command and Control

Command Definition	Joint Pub 1-02, *DoD Dictionary of Military and Associated Terms*, defines **command** as...*(It) includes the authority and responsibility for effectively using available resources and for planning the employment of, organizing, directing, coordinating, and controlling military forces for the accomplishment of assigned missions.*
Control Definition	Joint Pub 1-02, *DoD Dictionary of Military and Associated Terms*, defines **control** as...*Authority less than full command exercised by a commander over part of the activities of subordinate or other organizations.*
Functions of the ACE	Functions of the ACE (all of which will be discussed in this lesson and in your readings) include Control of aircraft and missiles Assault support Electronic warfare Antiair war Offensive air support Air reconnaissance
Marine Air Command and Control System	Marine Air Command and Control System (MACCS) resides in the Marine Air Control Group (MACG). It contains a Command system --TACC and supporting communications (comm) Control system --TAOC/DASC/ATC/LAAD/HAWK and supporting comm

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Concepts of Command and Control, Continued

Tactical Air Command Center	Tactical Air Command Center (TACC) Functions as the ACE commander's operational command post Monitors the current battle and directs the MACCS Plans for future battles, develops Air Task Orders (ATO), and is currently Contingency Tactical Air Planning System (CTAPS) capable
Marine Wing Communications Squadron	Marine Wing Communications Squadron (MWCS) Provides multichannel interface between MACCS agencies, less LAAM-to-TAOC Supports up to four airfields and eight forward sites Supports TACC and Air Traffic Control (ATC) Detachments (Dets) HFMHF single-channel for external comms/automated tactical telephone Provides comm center services
Tactical Air Operations Center	Tactical Air Operations Center (TAOC) Airspace control and management Surveillance Antiair warfare (AAW) control and direction in sector One TAOC per MACS Early wing capable Sector Antiair Warfare Center (SAAWC) facility
Air Traffic Control Detachments	Air Traffic Control Detachments (ATC Dets) Two dets per MAC All-Weather ATC service Task-organized Control tower, surveillance, radar precision, radar NavAid Navigational and separation services Early warning and detection to MACCS

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Concepts of Command and Control, Continued

Direct Air Support Center	Direct Air Support Center (DASC) Supports ground operations (ops) Maintains senior Fire Support Coordination Coordinator (FSCC) relationship Assigns procedural control Coordinates assigned missions with other assets Manages assigned terminal control assets
Low Altitude Air Defense	Low Altitude Air Defense (LAAD) Battalion Provides low altitude air defense to the MAGTF Is equipped with man-portable STINGER and Avenger (8 STINGER/.50 Cal MG/FLIR)
HAWK Capabilities	The HAWK answers to the TAOC, which is part of the Joint Air Control System (JAOC). HAWK capabilities include Medium altitude air defense against low level air threats and limited antimissile capability 12 engagement sections in both the active FMF and Reserves

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Concepts of Command and Control, Continued

U.S. Air Force Control Agencies	For joint operations, it will help you to know what other services offer in the way of air defense. The U.S. Air Force (USAF) air control agencies include
	Air Operations Center (AOC) - Senior agency, comparable to USMC TACC Monitors and directs current operations Plans future operations, makes ATO
	Combat Reporting Center (CRC) - Comparable to USMC TAOC Performs airspace surveillance and ID Controls weapon systems (fighters) and coordinates SAM fires with Army
	Combat Reporting Post (CRP) Performs airspace surveillance and ID under CRC Limited control of fighters
	Air Support Operations Center (AOSC) - Located at Army Corps, HQ, comparable to USMC DASC Coordinates fixed wing support for the Corps with AOC Coordinates incoming air support with FACs
	Airborne Warning and Control System (AWACS) Provides airborne surveillance, ID, weapon control, and traffic direction
	Airborne Battlefield Command and Control Center (ABCCC) Provides airborne CP for Army Corps and directs fixed wing support for the Corps with the ASOC and CRC
U.S. Army Air Control Agencies	The U.S. Army (USA) air control agencies include
	Battlefield Coordination Element (BCE) Corps liaison to AOC to coordinate airspace, requirements, and activities
	Flight Operations Center (FOC) Coordinates and directs helicopter activity and airspace use
	AN/TSQ-73 Missile Minder and Patriot Information Coordination Central Directs patriot fires under CRC

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Concepts of Command and Control, Continued

U.S. Navy Air Control Agencies	The U.S. Navy (USN) air control agencies include Tactical Air Control Center (TACC) which is comparable to USMC TACC and USAF AOC Directs and coordinates Naval air operations Monitors and directs current battle Plans and coordinates future battle; prepares ATO Helicopter Direction Center (HDC) Directs helicopter operations under TACC E-2C Hawkeye which is comparable to AWACS (though limited in comparison, it provides air surveillance and ID) Coordinates and directs strike operations Coordinates and controls fighters AEGIS cruisers Provide air surveillance and ID Provide SAM air defense against low level air threats and antimissile defense
Tactical Data Information Links	Tactical Data Information Links (TADILS) is a digital exchange of air picture information with five types of links. TADIL A: Netted link with multiple simultaneous participants. Users: AWACS, E-2C, Navy ships, USAF AOC/CRC, USMC TACC/TAOC TADIL B: Serial point-to-point link between any two capable users. Users: USMC TACC/TACO, Army Patriot ICC/TSQ-73, USAF AOC/CRC TADIL C: Point-to-point weapon control link. Users: USMC TAOC and FA-18s, Navy Aegis, and F-14s and FA-18s, USAF CRC and F-15s TADIL J: Netted future link to replace all three of the above. Required JTIDS capability NATO Link 1: Point-to-point serial link among users. Users: All NATO air agencies, USMC TACC/TAOC, USAF AOC/CRC

Concepts of Marine Aviation Assault Support

Marine Aviation Assault Support Definition	FMFRP 0-14, *Military and Associated Terms*, defines **Marine aviation assault support** as...*The use of aircraft to provide tactical mobility and logistic support for the MAGTF, the movement of high priority cargo and personnel within the immediate area of operations, in-flight refueling, and the evacuation of personnel and cargo.*
Other Descriptions	Other descriptions of aviation assault support are listed below: One of the six functions of Marine aviation Provides another means to shape the battlespace Ensures rapid build-up of combat power
Greatest Benefit	The greatest benefit aviation assault support provides is the ability to quickly maneuver ground forces to take advantage of fleeting battlespace opportunities.
Benefits to MAGTF	Air assault benefits the MAGTF by Combining speed and focus to shape the MAGTF battlespace Adding depth while allowing the commander to maneuver forces away from enemy strength Allowing the commander to move equipment or personnel via rapid movement to a place and time where the enemy will be placed in a predicament and forced to react, vice act.

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Concepts of Marine Aviation Assault Support, Continued

Categories of Assault Support	Categories of assault support (discussed in more detail below) include Air delivery Aerial refueling Air evacuation Tactical recovery of aircraft and personnel (TRAP) Air logistical support Battlespace illumination
Air Delivery	Air delivery is used for Transport of Equipment Supplies Personnel FOBs or remote areas Parachute or free fall
Aerial Refueling	KC-130 tanker aircraft conducts aerial refueling to Extend the range and on-station time of TACAIR and CH-53-E assets Allow the MAGTF to self-deploy aircraft, personnel, and supplies to areas of potential crises
Air Evacuation	Air evacuation can use either helicopters or fixed wing aircraft to Move equipment and personnel from forward operating bases or remote areas to the rear Conduct medical evacuation Conserve combat forces' fighting strength

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Concepts of Marine Aviation Assault Support, Continued

TRAP	Tactical recovery of aircraft and personnel (TRAP) does not replace combat search and rescue forces; however, it Fulfills the JCS requirements for each service to perform combat search and rescue (CSAR) Provides a secondary tasking Takes detailed planning
Air Logistical Support	Sometimes support from external sources or other services will be required to fulfill the MAGTF air logistical support. It Conducts by fixed wing aircraft Delivers troops, equipment, and supplies to areas beyond the range of helicopters Dictates by distance and limited ground transportation
Battlespace Illumination	Battlespace illumination is used to support MAGTF operations where illumination is required to conduct the mission. It Is provided by F/W and helo Has visible and invisible means available and must be planned for accordingly (METT dependent) Can be delivered by AH-1 or UH-1 platforms through 2.75 inch rockets (FW KC/AC-130 can deliver illumination but only when air superiority is achieved) Can be provided in minutes or hours

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Concepts of Marine Aviation Assault Support, Continued

Capabilities	The capabilities of air assault support include Observation Responsiveness Flexibility Extended radius of action Mobility Availability Morale-building effect Operation during limited visibility Night fighting Detailed planning for High threat Smaller formations Recognition of objective
Limitations	Limitations of air assault support include Limited visibility Effects of weather Landing zone ID Time on station Reduced radius of action Communications Enemy defenses (drives how assault support operations are conducted) The biggest limitation, as in all aviation operations, is a sophisticated air defense system.

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Concepts of Marine Aviation Assault Support, Continued

Employment	Employment of air assault support includes Attack (Timing is critical to ensure unit is in place before the main attack kicks off.) Exploit Pursue Secure and defend Recon in force Conduct a raid Support the MAGTF in the defense
Detailed Planning	What Marine leaders often fail to do effectively is detailed planning. Make sure you Identify The stated and implied tasks since they will impact availability of assets The "GO/NO-GO" criteria, which allows for branch or sequel planning to compensate for cancellation of mission Provide the ACE with your mission and concept of ops and wait for the assets, which include: Lift capacity Tactical range Supporting arms Availability Determine the threat--the driving factor in your planning. Decide whether the threat is High Medium Low Suppress, neutralize, or avoid the threat

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Concepts of Marine Aviation Assault Support, Continued

Examples of Employment	Examples of employing air assault support include Movement of a battalion to somewhere in the battlespace to support the main attack. The timing is critical to ensure the unit is in place before the main attack kicks off. Although not a part of assault support in the true sense of the tasks, you may find the Helicopter Composite Squadron tasked to provide Marine Helicopter Light Assault Squadron (HMLA) assets to delay an attack into the rear of the force depicted by neutralizing the enemy until TACAIR is free to support the attack. The ACE may be tasked with a mission to insert recon assets into a "no fire" area (NFA) to report on activity within the two objectives. Knowledgeable MAGTF staff officers who understand and appreciate the capability can use their imaginations and be aggressive in their use of air assault support.
Future of Assault Support	The future of assault support rests with the procurement and introduction of the MV-22 into the fighting force. It is a critical part of the triad where the Marine Corps will have the capability to conduct true maneuver from the sea.

Concepts of Electronic Warfare

Joint Pub 1-02

The following six definitions were taken from Joint Pub 1-02, *DoD Dictionary of Military and Associated Terms*.

Command and Control Warfare

Command and control warfare (C^2W) can be defined as the integrated use of

Operations security (OPSEC)
Military deception
Psychological operations (PSYOP)
Electronic warfare (EW)
Physical destruction mutually supported by intelligence to deny information to influence, degrade, or destroy adversary C^2 capabilities, while protecting friendly command and control capabilities against such actions.

It is the military strategy that implements information warfare on the battlefield and integrates physical destruction.

Electronic Warfare

Electronic warfare (EW) is defined as any military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the enemy. Electronic warfare includes the use of the following components, which will be discussed in more detail below.

Electronic warfare support (ES)
Electronic attack (EA)
Electronic protection (EP)

Electronic Warfare Support

Electronic warfare support (ES) may be defined as that division of electronic warfare involving actions tasked by, or under direct control of, an operational commander to **search for**, **intercept**, and **locate** sources of intentional and unintentional radiated electromagnetic energy for the purpose of immediate threat recognition.

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Concepts of Electronic Warfare, Continued

Electronic Protection	**Electronic protection (EP)** can be defined as that division of electronic warfare involving actions taken to protect Personnel Facilities Equipment Protection includes any effects of friendly or enemy employment of electronic warfare that **degrades**, **neutralizes**, or **destroys** friendly combat capability.
Electronic Attack	**Electronic attack (EA)** can be defined as that division of electronic warfare involving the use of electromagnetic or directed energy to attack Personnel Facilities Equipment The intention of the attack is to **degrade**, **neutralize**, or **destroy** enemy combat capability.
Information Warfare	**Information warfare (IW)** is defined as actions taken to achieve information superiority in support of national strategy by affecting adversary information and information systems while leveraging and defending our information and information systems. Information warfare is the battlefield of the future.

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Concepts of Electronic Warfare, Continued

Revolutions in Military Affairs (RMA)

Here is a comparison of nuclear warfare and information warfare. You will notice they are very different.

	Nuclear Warfare	Information Warfare
Technology	$E=MC^2$	Infospace
Capability	Massive lethality	Non-lethal/lethal
Objective	Deterrence/destruction	Win information
Strategies	Assured destruction Counterforce Flexible response	Information attack C^2 warfare Information influence/manipulation

Electromagnetic Spectrum

Fighting within the electromagnetic spectrum includes any of the following:

UV, UHF	VHF, HF
UV countermeasures	C^3 countermeasures
Laser warning	Missile warning
Flares	Acoustic decoys
Infrared CM	Sonobuoy
RF expendables	Fire control
Radar jamming	Acquisition radar
Radar warning receivers	Surveillance radar
Visual trackers	Command and control
Laser and laser guided missiles	Early warning radars
Infrared guided missiles	Homing torpedoes
Missile guidance radar	Sonar

Deception

Deception is an important aspect of any type of warfare. Through jamming, the enemy can be deceived into believing that a few targets could be many. Planning considerations include

Off-axis
Just prior to the attack
Corridor chaff

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Concepts of Electronic Warfare, Continued

Force Defense	In force defense, the aggressor must be radiating. It may take the form of indications and warning (I&W) or protection (SCUD, a surface-to-surface missile system). You must plan for Overhead for unknown attack axes Forward for known attack axes
Air Superiority	When using airborne emitters, air superiority is poor; when using ground-based emitters, air superiority is good. For planning Aviation C^2 Ground control intercept radar = Good Communications = Poor
Power Projection	Power projection includes the following broad capabilities. You will want to fill in the details of each through your readings Suppression of Enemy Air Defenses (SEAD) Electronic Control Warship (EWCAS) Deep air support Direct support/ground maneuver screening

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Concepts of Electronic Warfare, Continued

Special Operations	Special operations include
	Counternarcotics
	Hostage rescue
	Other "special missions"
Characteristics of Electronic Warfare Support	Characteristics of electronic warfare support include
	Dedicated land-based expeditionary capability
	Tactical Electronic Reconnaissance Processing and Evaluation System (TERPES) (Navy EP-3/E-S3)

Concepts of AntiAir Warfare

AAW Components	Components of AAW include the following: Offensive Antiair Warfare (OAAW) concepts Defensive AAW concepts
OAAW Definition	FMFM 5-50, *AntiAir Warfare,* defines the **concept of offensive antiair warfare** as...*Destroying or neutralizing the enemy's air and missile threat before it launches or assumes an attacking role.*
OAAW Concepts	Concepts of OAAW include Enemy airfields Air defense C^2 nodes Support facilities The joint term for OAAW is Offensive Counter Air (OCA).
Why OAAW?	The best defense is a good offense.
Defensive AAW Concepts	Defensive AAW (commonly referred to as air defense) includes both passive and active concepts: Active Surveillance C^2 Weapons employment Passive Camouflage Dispersion Mobility Protection construction

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Concepts of AntiAir Warfare, Continued

Why Air Defense?	Why plan on air defense?
	No OAAW operation can expect to be 100 percent effective Political restraints may preclude initial OAAW operation Must protect the force USMC concept of air defense is unique among services: Fully integrates aircraft and SAMS Based on "zone defense" Controlled by "exception" Decentralized battle management
Zone Defense Concepts	Zone defense concepts (which are C^2) permit you to
	Optimize freedom of action and capabilities of air defense weapons Execute zone defense **without** the C^2 system Provide control "by exception" to enhance defense Manage zones by decentralized battle management Segment the battlespace into weapon engagement zones (WEZ) with focus on terrain Decide which weapon system will defend each WEZ Employ weapon systems to defend WEZs Employ tankers to support fighters Employ C^2 systems as required Conduct battle management

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Concepts of AntiAir Warfare, Continued

Battle Management Concepts	Battle management concepts (also C^2) enable
	Centralized command of AAW in TACC
	Decentralized battle management by the Sector Antiair Warfare Coordinator/Center (SAAWC)
	SAAWC to be co-located at the TAOC with the exploitation of TAOC information and communication
	SAAWC to exercise control Fighter employment SAM employment Tanker employment
	In the joint role, the SAAWC becomes the Regional Area Air Defense Commander (RAADC).

Concepts of Offensive Air Support

OAS Categories	Offensive Air Support (OAS) categories include Deep air support (DAS) Air interdiction Armed Reconnaissance Close air support (CAS)
Deep Air Support Definition	FMFM 5-42 defines **deep air support (DAS)** as...*Air action against enemy targets at such a distance from friendly forces that detailed integration of each mission with fire and movement of friendly forces is not required.*
Two Types of DAS	Joint Pub 1-02, *DoD Dictionary of Military and Associated Terms* defines the two types of DAS: **Air Interdiction** - *Air operations conducted to destroy, neutralize, or delay the enemy's military potential before it can be brought to bear effectively against friendly forces and at such distances from friendly forces that detailed integration of each air mission with the fire and movement of friendly forces is not required.* **Armed Reconnaissance** - *A mission with the primary purpose of locating and attacking targets of opportunity, i.e., enemy materiel, personnel, and facilities in assigned general areas or along assigned ground communications routes, and not for the purpose of attacking specific briefed targets.*
Close Air Support Definition	FMFM 5-42 defines **close air support (CAS)** as...*Air action by fixed and rotary winged aircraft against hostile targets which are in close proximity to friendly forces and which require detailed integration for each air mission with the fire and movement of those forces.*

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Concepts of Offensive Air Support, Continued

OAS Mission Classifications

OAS mission classifications include

Preplanned mission
Preplanned schedule
Preplanned on-call
Immediate missions (FMFM 5-40)

MEF Level

At the MEF level, the OAS

OAS

Commander determines the "Commander's (Cmdr's) Intent" by understanding
MEF aviation capability and how it best supports the intent
MEF staff must completely understand the Cmdr's intent
MEF staff must ensure major subordinate commands (MSC) do not misunderstand the Cmdr's intent
Requires constant update both ways
Provides effective employment of MEF aviation assets by
Understanding its capabilities and limitations
Understanding aircrew/aircraft limitations
Understanding enemy capabilities/limitations
Matching OAS strength against enemy weakness
Depends on MEF planners' ability to estimate OAS requirements

OAS Capabilities and Limitations

This table shows OAS' capabilities and limitations.

Capabilities	Limitations
Variety of attack	Limited visibility
Observation	Weather
Responsiveness	Target acquisition
Flexibility	Target identification
Radius of action	Radius of action
Firepower and mobility	Time on station
Accuracy	Communication
Morale	Enemy defense

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Concepts of Offensive Air Support, Continued

MEF Focus	The MEF focus is on Integration with larger JT/combined campaign MEF mission retains primary focus for the MEF Cmdr METT-T-SL Mission Enemy Terrain and Wx Troops and support available Time available
MEF Aviation Planning	MEF aviation deliberate planning coordinates rapidly moving and potential conflicting operations. It includes Concurrent planning Parallel planning Detailed planning

Concepts of Air Reconnaissance

Definition	Joint Pub 1-02 defines **air reconnaissance** as...*The acquisition of intelligence information by employing visual observation and/or sensors in air vehicles.*
Functions	Air reconnaissance (recon) Collects multisensory imagery of areas of interest Provides and maintains surveillance of enemy activities or areas of interest Conducts airborne electronic reconnaissance Supports the direction and adjustment of artillery and naval gunfire Provides intelligence collection capabilities to the MAGTF Affords the MAGTF commander the ability to sustain coverage in areas of operations Provides rapid and current information on enemy composition, disposition, activity, installations, and terrain
Air Recon Categories	A single mission can employ any combination of the following types or categories of air recon: Visual reconnaissance Multisensory imagery reconnaissance Electronic reconnaissance
Visual Recon	Visual recon employs visual observation to get information about enemy activities and resources or the physical characteristics of a given area. There are more effective methods for information collection, but you want to use visual recon to complement and enhance the validity of information recorded from the other means. Consider the following when requesting visual recon: Provides immediate information on the disposition of friendly and enemy force Requires planning on a day-to-day basis, except during initial phases of amphibious operations, due to fluid nature of combat operations Requires close coordination with supporting arms due to low altitude flying requirements

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Concepts of Air Reconnaissance, Continued

Visual Recon Capabilities	Visual recon offers the following capabilities:
	Uses high performance aircraft for long range or high threat missions and light observation planes and helicopters as the situation dictates
	Uses trained naval aviation observers (NAOs)
	Performs night visual recon, but is generally restricted to route and area searches
	Uses helicopters for counterinsurgency operations
	Performs specialized observation missions (recon of woods, bridges, helicopter landing areas, urban areas, railroads, rivers, and beaches)
	Uses UAVs if enemy air defenses are unknown or not adequately suppressed, in heavily defended areas, and in contaminated environments
Visual Recon Limitations	Visual recon limitations include
	Limited visibility - Darkness and periods of limited visibility
	Crew fatigue - Normally, loss of effectiveness occurs after 2 hours of being airborne
	Radius of action - Aircraft fuel
	Communications - Requires reliable radio communications
	Weather - Low ceilings and poor visibility decrease visual recon effectiveness
	Enemy defenses - Sophisticated AAA deters visual recon

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Concepts of Air Reconnaissance, Continued

Visual Recon Tasks	Aircrews can spend more time on visual recon than any other duty. The tasks included in visual recon are Battlefield surveillance Area recon Specific recon Route recon Helicopter landing zone recon Terrain analysis Map correction Damage assessment Observation of ship-to-shore movement Air photography handheld cameras
Multisensory Imagery Recon	Multisensory imagery recon is the recording of information from a given sensor device. These devices detect and pinpoint the location of enemy installations. Types of devices include Photography - Offers the highest resolution, a variety of cameras, films, viewing angles, and scales. Poor visibility, cloud cover, and darkness limit photographic capabilities. Radar - Works when photography won't, but radar systems are detectable and susceptible to countermeasures. Infrared - Works also when photography won't. The video tape recording (VTR) system records information from the heads-up display (HUD) or other aircraft systems. These systems produce high resolution tapes.

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Concepts of Air Reconnaissance, Continued

Multisensory Imagery Recon Capabilities	Marine aviation supplies imagery for Beach analysis Detection of enemy movements Detection of offensive and defensive enemy assets Topographical analysis of bridges, choke points, roads, waterways, and terrain Planning avenues of approach for approach and retirement routes and landing zone analyses Pre-strike briefings and orientations Battle damage assessment
Multisensory Imagery Recon Limitations	Here are some of the multisensory imagery recon limitations: Weather - Affects employment of sensors, aircraft range, and ability to find targets Enemy defenses - Consider enemy SAMs, fighters, and small arms fires when evaluating risk and determining routes Range - Aircraft range Time on station - Aircraft's time on station is affected by distance from air base to target area, fuel consumption, ordinance load, and fuel reserves Radius of action - Amount of fuel limits radius of action Timeliness - Imagery must be processed and interpreted prior to dissemination which creates a time lag Time of day - Allow for shadow effects and radiation patterns

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Concepts of Air Reconnaissance, Continued

Multisensory Imagery Recon Tasks	The following are multisensory imagery recon tasks: Day sensor coverage Night recon Infrared imagery Radar imagery Electronic warning indications
Tactical Considerations	The MAGTF commander's decision to employ multisensory imagery recon includes MAGTF mission Concept of operations Area of operations characteristics MAGTF size and composition Supporting arms requirements Enemy forces type, composition, and organization Duration of anticipated expeditionary operations MAGTF aircraft and aircrew availability Logistics support Communications Enemy air defense capability Reserve forces availability

Required Readings

FM/FMFRP Readings

MCWP 3-2, *Aviation Operations*, chapter 1, "Aviation and the Marine Corps," pp. 1 to 6. Find this reading in the *FM/FMFRP Readings* (8800), pp. 243 to 249. These pages discuss aviation as part of combined arms, which hits the enemy from one arm (aviation) to another (infantry or artillery). Combined arms are effected with movement of forces, sustainment capability, and C^2 warfare techniques. The discussion continues by pointing out what the MAGTF provides a combined arms team and covers the six functions that MAGTF aviation provides.

FMFM Readings

FMFM 5-1, *Organization and Function of Marine Aviation*, chapter 2, "Operational Capabilities," pp. 2-1- to 2-8 and chapter 4, "Organizational Structure," pp. 4-1 to 4-2. Find this reading in the *FMFM Readings* (8800), pp. 269 to 278.

Chapter 2 provides a detailed discussion covering Marine aviation's functional areas. These functions AAW; OAS; Air Recon; and EW define Marine aviation capabilities. Operational concepts determine how Marine aviation accomplishes these functions.

Chapter 4 gives a brief look at how the Marine Aircraft Wing (MAW) is structured and shows a wire diagram.

FMFM 5-50, *Anti-Air Warfare*, chapter 1, "Fundamentals," pp. 1-1 to 1-6. Find this reading in the *FMFM Readings* (8800), pp. 307 to 312. Chapter 1 discusses AAW principles, OAAW, and defensive AAW.

FMFM 5-40, *Offensive Air Support*, chapter 1, "Offensive Air Support Fundamentals," pp. 1-1 to 1-3 and chapter 3, "Offensive Air Support Operations," pp. 3-1 to 3-8. Find this reading in the *FMFM Readings* (8800), pp. 295 to 306.

Chapter 1 discusses the historical evolution of the ACE, its functions, categories, mission classification, and future considerations.

Chapter 3 covers close-in fire support, close air support, and deep air support.

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Required Readings, Continued

FMFM Readings, continued

FMFM 5-10, *Air Reconnaissance*, Section II, "Multisensory Imagery Reconnaissance," pp. 3-1 to 3-5. Find this reading in the *FMFM Readings* (8800), pp. 279 to 283. This section reviews the capabilities, limitations, tasks, and tactical considerations of multisensory imagery recon.

FMFM 5-30, *Assault Support*, chapter 1, "Assault Support Fundamentals," pp. 1-1 to 1-4 and chapter 2, "Assault Support's Role in the MAGTF," pp. 2-1 to 2-5. Find this reading in the *FMFM Readings* (8800), pp. 285 to 293.

Chapter 1 gives a brief historical evolution of aviation, then discusses the categories of assault support operations: combat assault transport, air delivery, aerial refueling, air evacuation, air logistical support, and battlefield illumination. Additionally, it gives a brief overview of future considerations.

Chapter 2 covers the use of assault support at levels of war, the capabilities of assault support, and its limitations.

FMFM 5-70, *Aviation Planning*, chapter 3, "MAGTF Aviation Planning Within a Joint Force," pp. 3-1 to 3-4; chapter 4, "The MAGTF Air Tasking Cycle," pp. 4-1 to 4-7. Find this reading in the *FMFM Readings* (8800), pp. 317 to 327.

Chapter 3 covers the role of the MAGTF in a joint force.

Chapter 4 discusses the four phases of the air tasking cycle: Phase I: Apportionment and Allocation; Phase II: Allotment; Phase III: Tasking; and Phase IV: Scheduling.

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Required Readings, Continued

FM/FMFRP Readings

FMFRP 1-11, *Fleet Marine Force Organization*, 1992, chapter 5, pp. 5-5, 5-26 to 5-30, 5-32 to 5-35, and 5-37 to 5-39. Find this reading in the *FM/FMFRP Readings* (8800), pp. 91 to 129. Chapter 5 covers MACG; Marine Aircraft Group (MAG) HQ, Marine Aviation Logistics Squadron: Fixed Wing and Rotary Wing; Marine Air Refueler Transport Squadron; Marine Fighter Attack Squadrons; Marine Heavy Helicopter Squadrons; Marine Fighter/Attack Squadron (all weather); Marine Tactical Electronic Warfare Squadron; and the MAW.

FMFRP 5-62, *Multiservice Procedures for the Theater Air-Ground System*, chapter 2, pp. 12 to 21; chapter 3, pp. 25 to 30; chapter 4, pp. 35 to 37; chapter 5, pp. 42 to 45; and chapter 7, p. 60. Find this reading in the *FM/FMFRP Readings* (8800), pp. 185 to 221.

Chapter 2 covers the Army air-ground system.
Chapter 3 covers theater air C^2.
Chapter 4 covers MAACS.
Chapter 7, page 60, is a TAGS coordination links diagram.

Joint Pub Readings

Joint Pub 0-2, *Unified Action Armed Forces (UNAAF)*. Chapter 4 (read only the policy regarding control of USMC TACAIR), pp. IV-4 to IV-5. Find this reading in the *Joint Pub Readings* Vol. I (8800), pp. 198 to 199. This section briefly talks about TACAIR sorties.

Joint Pub 3-56.1, *Command and Control for Joint Air Operations*, chapter II, pp. II-1 to II-3, chapter IV, pp. IV-4 to IV-11. Find this reading in the *Joint Pub Readings* Vol. III (8800), pp. 935 to 946.

Chapter II discusses joint air operations and the Joint Forces Air Command Commander's (JFACC) responsibilities and relationships.

Chapter IV covers the joint ATO phases: Phase 1: JFC/component coordination; Phase 2: Target development; Phase 3: Weaponeering/allocation; Phase 4: Joint ATO development; and Phase 5: Force execution.

For Further Study

Supplemental Reading	The reading listed is **not** required. It is provided as a recommended source of additional information about topics in this lesson that may interest you. It will increase your knowledge and augment your understanding of this lesson. Mersky, Peter B. *U.S. Marine Corps Aviation: 1912 to the Present*, 2d ed. Baltimore: Nautical and Aviation Publishing Company of America, 1997.
References	The following references are **not** required. These references were used to address the topics presented in the lesson. They are included for your review as needed. Joint Pub 3-0, *Doctrine for Joint Operations.* *U.S. Marines in the Persian Gulf*, 1990-1991: "With the I Marine Expeditionary Force in Desert Shield and Desert Storm." *The 31st Commandant's Planning Guidance*, "A Marine Corps for the 21st Century." *Operational Maneuver from the Sea.*

Issues for Consideration

Functions	What are the six functions of Marine Aviation?
AAW	What are the two functional components of Antiair Warfare (AAW) and what are the concepts that support each?
OAS Categories	What are the major categories of Offensive Air Support (OAS)?
Air Recon	What are the three types of air reconnaissance?
Assault Support Operations	What are the categories of assault support operations?
Omnibus Agreement	What are the implications of the Policy for Command and Control of USMC TACAIR in sustained *Operations Ashore* (Joint Pub 0-2) formerly known as the Omnibus Agreement?
U.S. Armed Service Aviation Command	Explain the aviation command and control agencies of the U.S. Armed Services that perform similar functions of the Marine Tactical Air Command Center and Direct Air Support Center and how they interface to exchange information on the battlespace.
ACE Planning	How does ACE planning fit into the MAGTF commander's air tasking cycle? How does this process fit into the JFC's cycle?